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# THE STATUS OF SPRUCE BUDWORM INFESTATIONS IN FOREST SERVICE REGION 4

November 1961

By

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# SPRUCE BUDWORM INFESTATIONS IN REGION 4

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## INTRODUCTION

The spruce budworm Choristoneura fumiferana (Clem) has been present in mixed conifer stands of southern Idaho for many years. It is distributed throughout fir forests of the United States and Canada. The spruce budworm was first found in the West about 1915 but was not recorded as an important pest until 1923, at which time two outbreaks were reported in separate areas in Idaho. The insect is believed to be indigenous to the West.

In 1952 spruce budworm infestations in southern Idaho began to increase in extent and severity. The aerial and ground surveys in 1953 disclosed infestation on approximately 197,500 acres. Of this 86,000 acres were sprayed in conjunction with the 1954 pine butterfly control project. The 1954 survey showed approximately 1,000,000 acres of spruce budworm infested timber of which 893,214 acres were sprayed in 1955. 475,000 acres were sprayed in 1956. A total of 660,632 acres were found to be infested by the 1956 fall survey all of which were sprayed in 1957. The 1957 surveys found only low level populations of spruce budworm in southern Idaho. Since 1958 the spruce budworm population has been building up again but no control has been undertaken since 1957.

## CURRENT CONDITIONS

The 1960 survey crews mapped 516,000 infested acres of which 417,000 were lightly defoliated, 79,000 acres classed as medium and only 20,000 acres heavily defoliated. Biological data collected in 1960 did not indicate any major increasing trend of the budworm population.

A widespread increase of budworm damage occurred during the spring and summer of 1961. Results of the fall aerial survey show budworm infestations now cover over 1.4 million acres and in four distinct areas. These areas are designated as the Salmon River, Profile Creek, Targhee National Forest and Sawtooth National Forest infestations. The infestations are primarily in Douglas-fir stands but true fir and Engelmann spruce are also attacked.

In this report three damage classes are used and in each case they refer only to current defoliation. The classes are defined by the estimated percent of current foliage destroyed and are as follows:

Light - Any defoliation visible from the air; usually between 20 to 50 percent.

Medium - 50 to 75 percent defoliation.

Heavy - Over 75 percent defoliation.

Salmon River Infestation: The Salmon River infestation covers parts of the Salmon, Challis, Payette and Boise National Forests. It runs along the main Salmon River from Big Bear Creek upriver nearly to the town of Challis, Idaho. In addition the main side drainages Middle Fork, Panther Creek, Lemhi River and North Fork are infested. Altogether there are 1.3 million acres of budworm in the Salmon River infestation. Acreages by forests and damage classes are given in the following table:

1961 Salmon River Infestation

| National Forest | Light | Medium | Heavy | Total |
|---|---|---|---|---|
| Salmon National Forest | 350,000 | 117,000 | 391,000 | 858,000 |
| Challis National Forest | 254,000 | 14,000 | 90,000 | 358,000 |
| Payette National Forest | 8,000 | 15,000 | 8,000 | 31,000 |
| Boise National Forest | 5,000 | 7,000 | 19,000 | 31,000 |
| Total | 617,000 | 153,000 | 508,000 | 1,278,000 |

A comparison with the 1960 budworm infestation shows the following:

| Forest | Damage class | 1960 averages | Percent in each class | 1961 averages | Percent in each class |
|---|---|---|---|---|---|
| Salmon | Light | 100,000 | 87% | 350,000 | 41% |
| | Medium | — | | 117,000 | 14% |
| | Heavy | 15,000 | 13% | 391,000 | 45% |
| | Total | 115,000 | | 858,000 | |
| Challis | Light | 100,000 | 67% | 254,000 | 71% |
| | Medium | 50,000 | 33% | 14,000 | 4% |
| | Heavy | — | | 90,000 | 25% |
| | Total | 150,000 | | 358,000 | |
| Payette | Light | | | 8,000 | 26% |
| | Medium | none reported | | 15,000 | 48% |
| | Heavy | | | 8,000 | 26% |
| | Total | | | 31,000 | |

| Forest | Damage class | 1960 averages | Percent in each class | 1961 averages | Percent in each class |
|---|---|---|---|---|---|
| Boise | Light | | | 5,000 | 16% |
| | Medium | none reported | | 7,000 | 23% |
| | Heavy | | | 19,000 | 61% |
| | Total | | | 31,000 | |
| Total | Light | 200,000 | 75% | 617,000 | 48% |
| | Medium | 65,000 | 25% | 153,000 | 12% |
| | Heavy | | | 508,000 | 40% |
| | Total | | | 1,278,000 | |

In 1961 the total area increased 2.75 times, and the percent of area in the medium and heavy classes increased from 25% to 52%.

The above table shows that the greatest increase in total area infested occurred on the Salmon National Forest. This area now has nearly twice as many acres of heavy defoliation than total acres infested in 1960.

Throughout the infestation pupae and adult density was much heavier than the previous year. Pupae and adult parasitism was light, averaging less than 1%.

It is expected the increasing trend of the budworm in the Salmon River infestation will continue at least through next year.

Profile Creek Infestation: The Profile Creek infestation is located at the mouth of Profile Creek on the Payette National Forest and across the South Fork of the Salmon River running from No Man's Creek to Pepper Creek on the Boise National Forest. The infestation is divided by forest and damage class as follows:

| | Damage Class (No. of Acres) | | | |
|---|---|---|---|---|
| National Forest | Light | Medium | Heavy | Total |
| Payette National Forest | --- | 3,500 | --- | 3,500 |
| Boise National Forest | 1,400 | 2,100 | 1,000 | 4,500 |
| Total | 1,400 | 5,600 | 1,000 | 8,000 |

This infestation is isolated and separated by some 15 air miles from the nearest budworm infestation. A budworm population has been present in the area for several years, but has caused only very light defoliation. This year sufficient budworm developed to cause light defoliation on 1,400 acres and medium and heavy damage on 6,600 acres.

Targhee National Forest Infestation: The spruce budworm activity on the Targhee National Forest is considered as one infestation. The infestation runs along the northern edge of the forest from about the West Fork of Indian Creek (approximately ten miles west of Spencer, Idaho) eastward on around Henry's Lake and thence to the south as far as Garner Canyon. Altogether there is over 126,000 acres of visible defoliation of which 20,000 is classed as light, 67,000 medium, 39,000 heavy. The heavy defoliation occurs as ten hot spots scattered throughout the infestation.

While the total infested area on the Targhee National Forest remained about the same as it was last year (131,000 in 1960 against 126,000 in 1961) the amount of current damage increased. Last year only 3% of the total area was heavily defoliated and 23% fell within the medium damage class. This year 31% of the total was classified as having heavy and 53% medium current defoliation.

Sawtooth National Forest Infestation: The Sawtooth National Forest spruce budworm infestation is on the south side of the South Fork of the Boise River and extends up the side drainage called the Big Little Smoky Creek.

The total area of visible defoliation is 13,000 acres considerably less than the 121,000 acres mapped during the 1960 survey. However, the 1961 survey showed 5,000 acres of heavy damage and 3,000 medium, whereas the 1960 survey listed no medium damage and only 1,000 acres of heavy. The big difference between the 1960 and 1961 surveys is in the area mapped as lightly defoliated. The 1960 report listed 120,000 acres of light and the 1961 survey mapped only 5,000 acres. Actually this difference may be more the result of what was visible from the air rather than a decrease in total area with light population of budworm. Even with the increased acreage in the medium and heavy classes, entomologically there does not seem to be an urgent need to spray the Sawtooth infestation next year.

## PRIORITY CONTROL AREAS

Because of the huge area of total budworm infestation priority control areas have been selected which are feasible units for a possible stage control effort. The areas selected include the higher value areas where losses are imminent. Size and control boundaries were set on the basis of least danger of reinfestation from untreated areas in order to provide entomologically sound treating units.

They are as follows:

I. North Fork of Salmon River Unit. This unit encompasses all of the North Fork of the Salmon River and the north side of the main Salmon River down to Owl Creek. Out of the total of 227,000 acres in the unit 179,000 or 79% received heavy

defoliation in 1961. Pupae and adult populations were high andan increasing trend is forecast for both budworm populations and expected damage. The area has been subjected to several years of consecutive defoliation. In 1960 this area contained two so-called hot spots where current damage was classed as heavy with budworm population at a high level.

II. Targhee National Forest Unit. As described earlier in the report this unit covers all infestations on the Targhee National Forest. The total area of infestation is 126,000 acres. Much of this infestation has also been defoliated by the budworm for three or more years. This year there was a significant increase in the acreage of both the medium and heavy damage classes. In all probability the budworm population will increase next year.

III. Profile Creek Unit. This unit includes all the infestations described under the Profile Creek infestation. The infestation is separated from other budworm areas, but is surrounded by stands of host type. The infestation has been present for several years but damage this year was much heavier than last year. This small infestation of only 8,000 acres is a nucleus from which a widespread infestation might develop. There is no certainty this will happen, but the threat is there.

These three areas have a total of 361,000 acres 80% of which received medium to heavy defoliation in 1961. All have about equal priority from the entomological viewpoint.

## DISCUSSION

Region 4 now has 1.4 million acres of spruce budworm infestations an increase of 275% over that recorded in 1960. Damage levels also are much higher. Only 19% or 100,000 acres fell within the medium and heavy damage classes in 1960. In 1961 56% or 800,000 acres were classed as medium or heavy of which 70% was heavily defoliated.

Pupal counts in all areas sampled show a significant increase in numbers, generally two to three times as many as found last year. All areas sampled fell within Class III which is the next to highest relative pupal density classification that has been experienced in southern Idaho. This represents a one class increase over last year.

The budworm picture for 1961 differs considerably from our predicted trend as reported last fall. While our fall predictions have been fairly accurate, this upsurge points out the hazard of depending entirely upon fall predictions. While they may prove accurate a majority of the time variables such as mild winters, unseasonably warm dry springs, egg mass production over the usual, higher than normal egg hatch, and high larval survival cannot all be measured by early fall. Fall predictions are important and should be continued to provide a working base, but as with all forest insects repeated examinations are necessary to evaluate factors influencing insect populations.

# KEY TO SPRUCE BUDWORM INFESTATIONS

1. Targhee National Forest

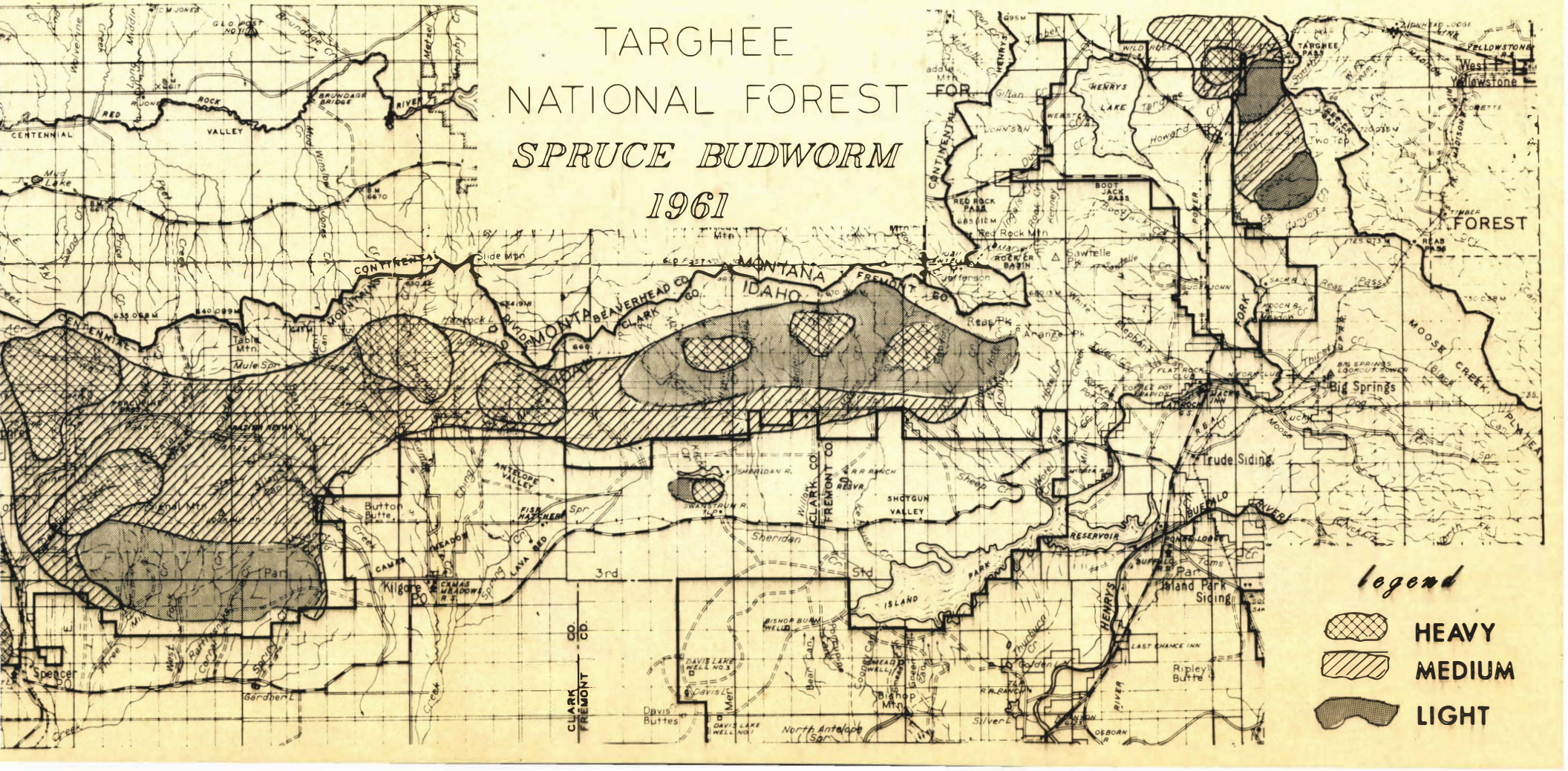
2. Sawtooth National Forest

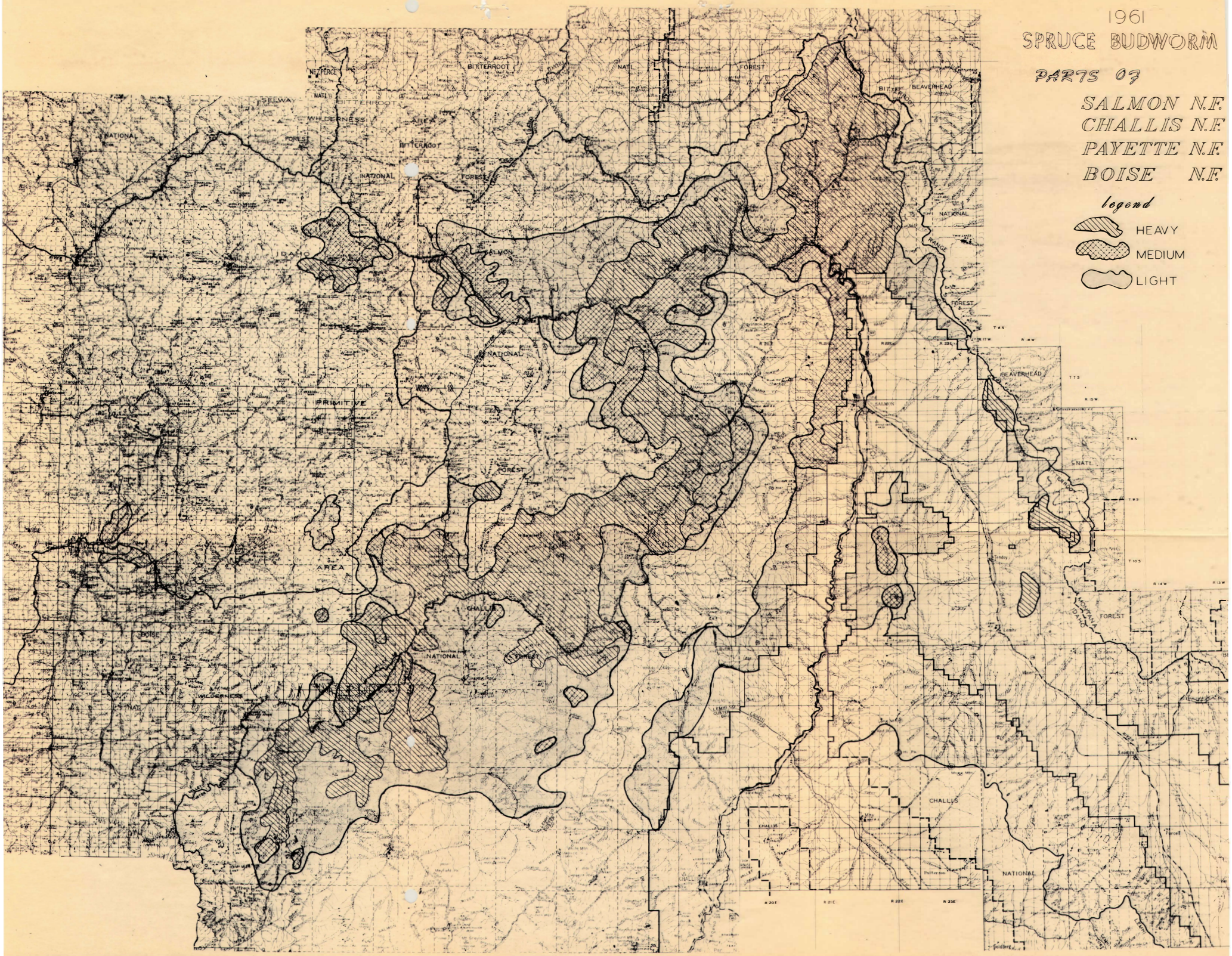
3. Salmon, Challis, Payette and Boise National Forest

# TARGHEE NATIONAL FOREST

## SPRUCE BUDWORM

## 1961



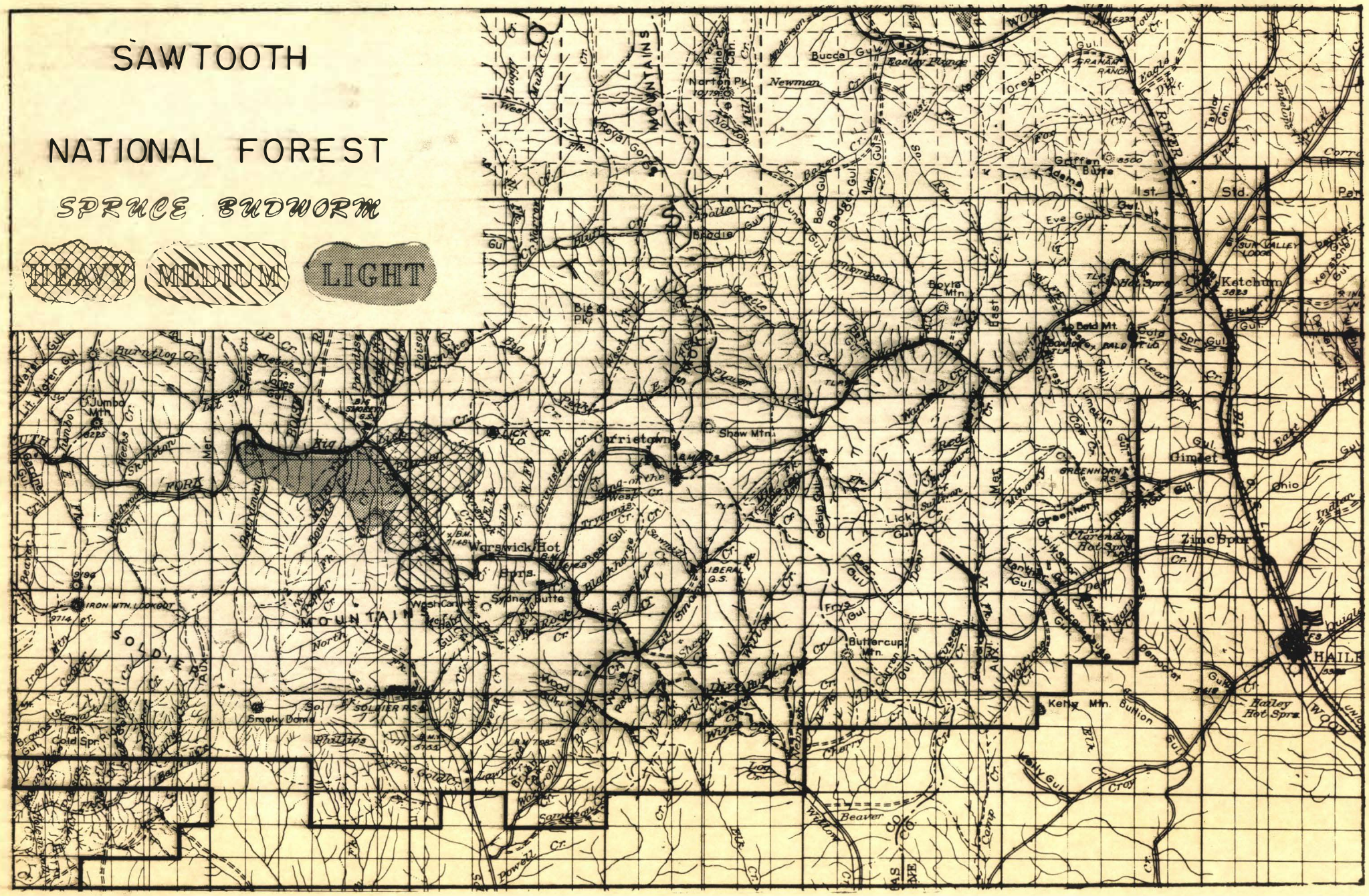

1961
SPRUCE BUDWORM
PARTS OF
SALMON N.F.
CHALLIS N.F.
PAYETTE N.F.
BOISE N.F.
legend
HEAVY
MEDIUM
LIGHT
BITTERROOT
NATIONAL
FOREST
BEAVERHEAD
SELWAY
WILDERNESS
AREA
PRIMITIVE
SALMON
CHALLIS
BOISE
IDAHO
MONTANA
RANGE

# SAWTOOTH

# NATIONAL FOREST

## SPRUCE BUDWORM

HEAVY MEDIUM LIGHT



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